

CLAIMS

What is claimed is:

1. A method of fuel cell start-up for a fuel cell system having a hydrogen source connected to an anode inlet of a fuel cell stack and an oxygen source connected to a cathode inlet of the fuel cell stack, the cathode inlet being connected to a compressor, the fuel cell stack being purged of hydrogen prior to start-up, the method comprising the steps of:

introducing hydrogen to the anode inlet of the fuel cell stack;

applying an electrical load to the fuel cell stack via the compressor for supplying additional oxygen to the cathode inlet;

gradually increasing the electrical load to the fuel stack over time while using the increased electrical load to drive the compressor to supply additional oxygen to the cathode inlet.

2. The method according to claim 1, wherein the step of introducing hydrogen to the anode inlet includes opening a valve to release hydrogen flow to the anode inlet.

3. The method according to claim 2, wherein said valve is opened manually.

4. The method according to claim 2, wherein said valve is opened by an electronic solenoid.

5. The method according to claim 1, wherein said step of gradually increasing the electrical load to the fuel cell stack is performed by an electronic controller for monitoring cell voltages of the fuel cell stack and commanding a compressor motor to load the fuel cell stack and to increase the load on the fuel cell stack as the cell voltages of the fuel cell stack increase.

6. The method according to claim 1, wherein said step of gradually increasing the electrical load to the fuel cell stack is performed until the fuel cell stack produces enough electrical power to operate at a positive net power.

7. The method according to claim 1, wherein said step of gradually increasing the electrical load to the fuel cell stack is performed on an open loop basis according to a timed schedule.

8. The method according to claim 1, further comprising the step of releasing a stored oxygen source into the cathode inlet after the step of introducing hydrogen to the anode inlet.

9. The method according to claim 1, further comprising the step of releasing a pressurized gas into a passage upstream of the cathode inlet for forcing oxygen in said passage into said fuel cell stack.

10. The method according to claim 9, wherein said pressurized gas is provided from a burp valve provided in an anode exhaust passage of the fuel cell stack.